IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant of:

Iseki et al.

Serial No.: 09/500,132 Group Art Unit: 1772

Filed: June 8, 2000 Examiner: C.A. Simone

Title: Functional Roll FILM AND VACCUM EVAPORATION APPARATUS CAPABLE OF PRODUCING THE FUNCTIONAL ROLL FILM

DECLARATION UNDER RULE 132

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Kiyoshi Iseki, a citizen of Japan and residing at 1-1, 2-Chome, Katata, Ohtsu-shi, Shiga-ken, Japan, c/o: Research Center of TOYO BOSEKI KABUSHIKI KAISHA, declare and Say as follows:

1. I was graduated from Master's program of the Department of Electronic Faculty of Engineering and Design, Kyoto Institute of Technology University in march of 1985.

2. Since April of 1985 to the present time, I have been employed by TOYO BOSEKI KABUSHIKI KAISHA.

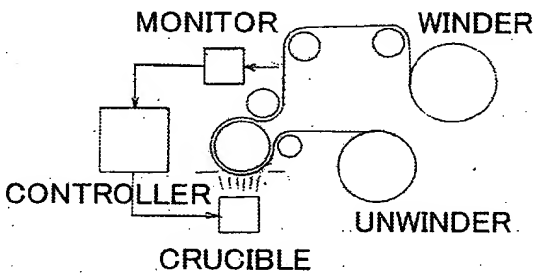
3. I have been working in the research in the fields of Thin Film for 18 years.

4. I am one of the inventors of the above-identified application and am familiar with the subject matter thereof.

5. I have read the Official Action mailed and the references cited therein and am familiar with the subject matter thereof.

6. A vapor-deposited coating generation technique when the Misiano invention was applied (March 2, 1993) is explained below.

In order to control coating thickness to form coating of uniform thickness on the film surface, a monitor technique for measuring the coating thickness and a coating thickness control technique are essential. Conventional coating thickness control equipment is shown as follows (Ref. 1).



Because this coating thickness control equipment vapor-deposits Al on the film and controls the coating thickness (different point) in the width direction, it is superior to Misiano's, and can be considered the most sophisticated system at that time. In this equipment, the coating thickness is measured by an optical system (same point), and based on the measurement results, coating thickness is controlled. That is, in aluminum vapor-deposition of Ref. 1, coating thickness is not directly measured but light is applied from the film rear surface and the

transmission rate is measured, and making the best of the relation between the coating thickness and the transmitted light volume, the transmission rate is outputted to the controller. The controller compares and computes the output from the monitor and the target value, and computes the deviation. In order to correct the deviation, electric power for heating the vapor-deposition material in the crucible is controlled. By controlling the electric power for heating, the coating thickness is controlled by carrying out the control in the following order:

Heating electric power → vapor-deposition material temperature → evaporation rate → deposition rate on film

7. I supervised the measurement of coating thickness variations on the film using the above system as follows:

Vapor-deposited coating slightly colored was formed by vapor-depositing SiOx on the PET film and coating thickness variations when coating was formed was investigated.

To the SiO series, vapor-deposition was carried out by applying the control system of Al vapor-deposition technique. The monitor used for control adopts the light transmitting rate. For monitoring the condition, a fluorescent X-ray monitor set forth in the specification of the application concerned was used in addition to this.

To the PET film, SiOx coating was formed at a rate of 360 m/min with SiO used as raw material. The film was 30,000 m long and 2,000 mm wide. An electron gun was used for the heating source, and the electric power for the electron gun was controlled by signals received from the optical system coating thickness monitor.

For the evaporated film, a 400 mm x 4,000 m roll was slit. From the slit roll, 10 points were chosen in the width direction and length direction, and coating thickness was measured, and the measurement results are shown in Table 1. Based on the measurement results shown in Table 1, the thickness of the thickest portion (maximum value = 61 nm) is 1.69 times thicker than that of the thinnest portion (minimum value = 36 nm), which exceeds 1.5 times.

Even when forming of the coating of SiO series, which is easy to control, is controlled by an optical system coating thickness monitor using the technique when the Misiano invention was applied, it cannot be controlled in the manner as described in the invention of the application concerned. It is still more difficult to control the coating thickness to the specified range in the Al_2O_3-SiO_2 series, which provides higher transparency and is difficult to monitor.

[Table 1]

	Coating thickness (nm)
1	51
2	58
3	38
4	61
5	36
6	40
7	53
8	39
9	52
10	42

8. Based on the results mentioned above, by the technique when the Misiano invention was applied, thickness of the vapor-deposited coating cannot be kept uniform in the range as achieved by the invention of the application concerned. This is because Misiano's technique has no control mechanism which the invention of the application concerned has. Consequently, at the time of the Misiano invention, it would has been is extremely difficult and improbable to continuously keep the thickness variation at or below a ratio of 1.5 throughout the full width and the full length of the long-size roll-form film. Therefore, when Misino discloses "a completely uniform coating to a constant thickness", it does not teach or suggest a film so uniform that the thickness variation ratio is 1.5 or less.

9. I declare further that all statements made herein of may own knowledge are true, and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issuing thereon.

- this 12th day of Nov. , 2003

Kiyoshi Iseki

Kiyoshi Iseki